

Claims

1. A method for cleaning objects, in which a vapor produced by heating an active cleaning liquid is brought into contact with to-be-cleaned objects, characterized in that an azeotropic preparation in the form of a mixture made of water and at least one additional component having molecules with hydrophilic and lipophilic groups is used, wherein the additional component(s) and the water form an azeotrope at the phase transition liquid phase/vapor phase.

2. A method according to Claim 1 comprising the steps in which:

- an azeotropic preparation is formed from water and at least one component having molecules with hydrophilic and lipophilic groups in a weight ratio (component(s) with hydrophilic and lipophilic groups) : water of 0.05-99.95 to 99.5-0.05;

- the to-be-cleaned objects are brought at least once into contact with the azeotropic preparation and liquid azeotropic preparation is allowed to drain off, inclusive of impurities from to-be-cleaned objects removed thereby;

- residues of the azeotropic preparation on and/or in the to-be-cleaned objects are removed by evaporation; and

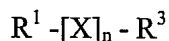
- the vapor of the azeotropic preparation is condensed and the azeotropic preparation recovered by condensation is used for a cleaning step once again.

3. A method according to Claim 1 or Claim 2, wherein the to-be-cleaned objects are brought at least once into contact with a vapor of the azeotropic preparation and, during the duration of the contact, the vapor of the azeotropic preparation is allowed to condense on the to-be-cleaned objects.

4. A method according to one of Claims 1 to 3, wherein an azeotropic preparation is used as the active cleaning liquid in the form of a mixture made of water and at least one additional component having molecules with hydrophilic and lipophilic groups, wherein the additional component(s) and the water form an azeotrope at the phase transition liquid phase/vapor phase and the azeotrope is an azeotrope having an immiscibility gap at a temperature between 0 °C and the temperature of the phase transition liquid phase/vapor

phase at standard pressure, preferably an azeotrope having an immiscibility gap at a temperature in the range from 20 °C and 110 °C at standard pressure.

5. A method according to one of claims 1 to 4, wherein an organic component of the general formula



is used, in addition to water, as a further component of the cleaning-active liquid, wherein:

- R^1 and R^3 each independently represents H; straight-chain or branched, saturated or unsaturated C_1 - to C_{12} -alkyl groups, in which one or more nonadjacent $-CH_2-$ groups can be replaced by $-O-$; saturated or unsaturated cyclic C_1 - to C_8 -alkyl groups, in which one or more nonadjacent $-CH_2-$ groups can be replaced by $-O-$; hydroxy; C_1 - to C_8 -alkoxy; amino, wherein one or both hydrogen(s) can be replaced by C_1 - to C_8 -alkyl groups; and

X represents $-O-$; $-C(=O)-$; $-C(=O)-O-$; $-NH-$; $-NR^1-$; $-N(-OH)-$; straight-chain or branched $-(C_1$ - to $C_8-)$ alkylene groups in which one or more nonadjacent $-CH_2-$ groups can be replaced by $-O-$; and n represents integers 1, 2, 3, etc.

6. A method according to one of Claims 1 to 5, wherein the mixture ratio of water and the additional component(s) in the azeotropic preparation is substantially set at the ratio, which is present in the vapor that results by heating the liquid azeotropic preparation.

7. A method according to one of Claims 1 to 6, wherein at least one cleaning booster, which does not independently vaporize, and/or at least one corrosion preventing additive is added, preferably at least one cleaning booster, which does not independently vaporize and/or at least one corrosion preventing additive that distill(s) with the azeotropic preparation.

8. A method according to one of Claims 1 to 7, wherein an azeotropic preparation made of water and one organic component is used as the active cleaning liquid.

9. A method according to one of Claims 1 to 8, wherein an azeotropic preparation made of water and one organic component is used in relative amounts of $(100 - x)$ wt% : x wt%, wherein x is in the range $0 < x \leq 35$, preferably in the range $3 \leq x \leq 25$, particularly preferably in the range $4 \leq x \leq 15$.

10. A method according to one of Claims 1 to 7, wherein an azeotropic preparation made of water and two organic components is used as the active cleaning liquid, preferably an azeotropic preparation made of water, dipropyleneglycolmono-n-propylether and an additional organic component.

11. A method according to one of Claims 1 to 10, wherein an azeotropic preparation made of water, a glycol ether, preferably dipropyleneglycolmono-n-propylether, and an additional organic component is used as the active cleaning liquid in relative amounts of 90 wt%: (10 -y) wt% : y wt%, wherein y is in the range $0 < y \leq 5$, preferably in the range $0 < y \leq 2$.